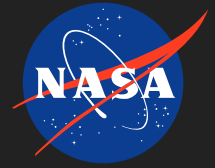


## Lightweight Thermal Storage Heat Exchangers, Phase I

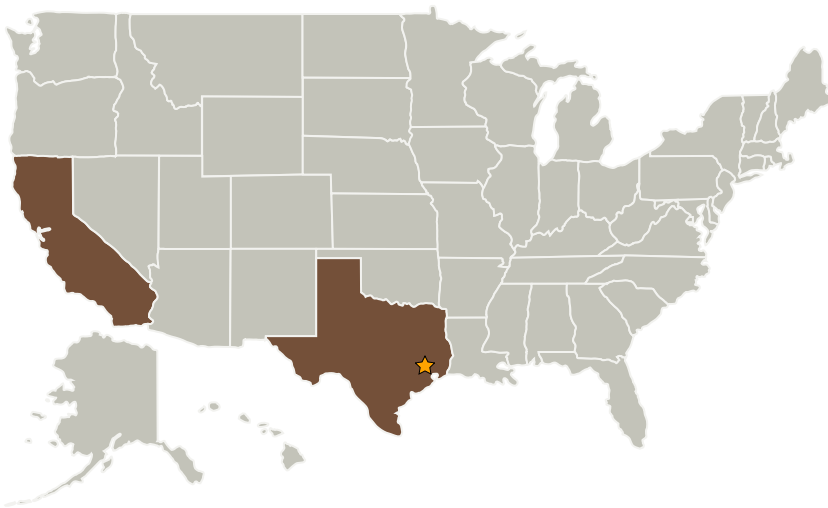
Completed Technology Project (2008 - 2008)



## Project Introduction

This SBIR proposal aims to develop thermal energy storage heat exchangers that are significantly lighter and higher conductance than the present art which involves significant metal weight. We aim to use carbon fiber for conductive and convective heat transfer enhancements and replace metal with novel carbon-polymer composites. The concept materials can be configured to serve a broad range of thermal management applications for NASA, in particular thermal storage heat exchangers. Phase 1 will gather NASA requirements for near term systems involving active cooling with single- and two-phase loops passive cooling with heat pipes. In particular the Constellation program and the Orion vehicle will be considered to assess the potential benefits of the proposed materials approach. Initial fabrication and characterization of the materials concept will be performed. Design options for Phase 2 development units will be prepared.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Energy Science Laboratories, Inc.	Supporting Organization	Industry	San Diego, California



Lightweight Thermal Storage Heat Exchangers, Phase I

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Johnson Space Center (JSC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

# Lightweight Thermal Storage Heat Exchangers, Phase I

Completed Technology Project (2008 - 2008)



## Primary U.S. Work Locations

California

Texas

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Timothy E Knowles

## Technology Areas

### Primary:

- TX14 Thermal Management Systems
  - └ TX14.2 Thermal Control Components and Systems
    - └ TX14.2.3 Heat Rejection and Storage